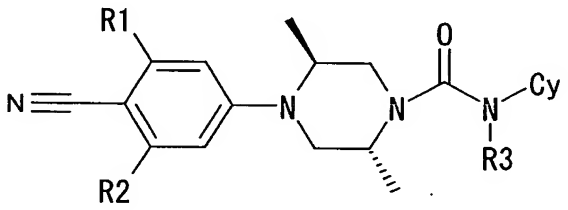
Claims

1. An N-phenyl-(2R,5S)dimethylpiperazine derivative represented by the following general formula (I) or a salt thereof:



(I)

wherein the symbols in the formula have the following meanings:

R^1: Cl, F, Br, -CN, $-CH_3$, $-CF_3$, or -O-lower alkyl

R^2: H, F, or $-OCH_3$

R^3: H or lower alkyl

Cy: a group represented by the following a) to e) groups

a) -benzene (monosubstituted by -CN, $-COCH_3$, or $-OCF_3$)

b) -benzene (phenyl monosubstituted by a group selected from $-SCF_3$, $-OCH_3$, $-NO_2$, and 1-CN-cyclopropyl-1-yl, or disubstituted by groups one of which is -CN and another one of which is selected from $-OCF_3$, $-OCH_3$, $-CH_3$, $-CF_3$, and -Cl)

c) -pyridine (substituted by -CN, $-CF_3$, halogen, $-OCH_2CF_3$, or cyclopropyl)

d) -pyrimidine (monosubstituted by lower alkyl or cyclopropyl)

e) -imidazopyridine (optionally substituted by lower alkyl)

-benzopyrazine (optionally substituted by lower alkyl or cycloalkyl)

-quinoxaline (optionally substituted by -O-lower alkyl or morpholinyl)

-quinoline (optionally substituted by lower alkyl or morpholinyl)

-benzothiazole (optionally substituted by lower alkyl)

-isoquinoline

-benzothiadiazole (optionally substituted by lower alkyl)

-indolidine or tetrahydrobenzofuran (optionally substituted by oxo)

provided that, when R^1 is $-CF_3$ and R^2 is H, Cy represents a group other than the c) group.

2. The N-phenyl-(2R,5S)dimethylpiperazine derivative or salt thereof according to claim 1, wherein R^1 is Cl, F, Br, -CN, $-CH_3$, or -O-lower alkyl and R^3 is H.

3. The N-phenyl-(2R,5S)dimethylpiperazine derivative or salt thereof according to claim 2, wherein Cy is a group selected from the c) group.

4. A compound selected from (2R,5S)-4-(3-chloro-4-cyanophenyl)-N-(2-cyclopropylpyrimidin-5-yl)-2,5-dimethylpiperazine-1-carboxamide; (2R,5S)-4-(3-chloro-4-

cyanophenyl)-N-(6-cyano-3-pyridyl)-2,5-dimethylpiperazine-1-carboxamide; (2R,5S)-4-(4-cyano-3-methoxyphenyl)-2,5-dimethyl-N-(6-trifluoromethyl-3-pyridyl)piperazine-1-carboxamide; (2R,5S)-4-(3-bromo-4-cyanophenyl)-2,5-dimethyl-N-(6-trifluoromethyl-3-pyridyl)piperazine-1-carboxamide; and (2R,5S)-4-(4-cyano-3-trifluoromethylphenyl)-N-(2-cyclopropylpyrimidin-5-yl)-2,5-dimethylpiperazine-1-carboxamide, or a salt thereof.

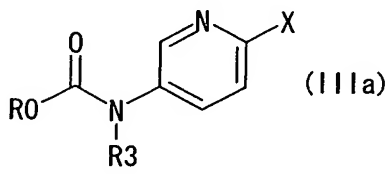
5. A pharmaceutical composition comprising the N-phenyl-(2R,5S)dimethylpiperazine derivative according to claim 1 or a pharmaceutically acceptable salt thereof as an active ingredient.

6. A prostate cancer-treating agent comprising a therapeutically effective amount of the N-phenyl-(2R,5S)dimethylpiperazine derivative according to claim 1 or a pharmaceutically acceptable salt thereof as an active ingredient.

7. Use of N-phenyl-(2R,5S)dimethylpiperazine derivative according to the above (1) or a pharmaceutically acceptable salt thereof for manufacturing a medicament for treating prostate cancer which comprises a therapeutically effective amount of the same as an active ingredient.

8. A method for treating prostate cancer which comprises administering a therapeutically effective amount of the N-phenyl-(2R,5S)dimethylpiperazine derivative according to claim 1 or a pharmaceutically acceptable salt thereof.

9. A compound represented by the following general formula (IIIa) or a salt thereof:



(IIIa)

wherein the symbols in the formula have the following meanings:

R^3: H or lower alkyl, and

1) when X is F, Br, -CN, or $-CF_3$,

R: lower alkyl, halogeno-lower alkyl, phenyl optionally substituted by nitro, or succinimide optionally substituted by OH,

provided that, when R is tert-butyl, X represents -CN, or

2) when X is Cl,

R: halogeno-lower alkyl, phenyl optionally substituted by nitro, or succinimide optionally substituted by OH.